

**June '18**



# **Sensu 101 - Intro to Sensu**

**Texas Linuxfest Workshop**

# Objectives

- Components of Sensu deployment
- Sensu configuration building blocks
  - Checks
  - Filters
  - Mutators
  - Handlers
- Put the pieces together and have your own monitoring solution



# Before We Start...

```
git clone https://github.com/sensu/training-vagrant.git  
cd training-vagrant/workshops/intro-to-sensu  
vagrant up
```



# Monitoring

- What is monitoring?
- How is it different than observability?
- Why should I monitor something?

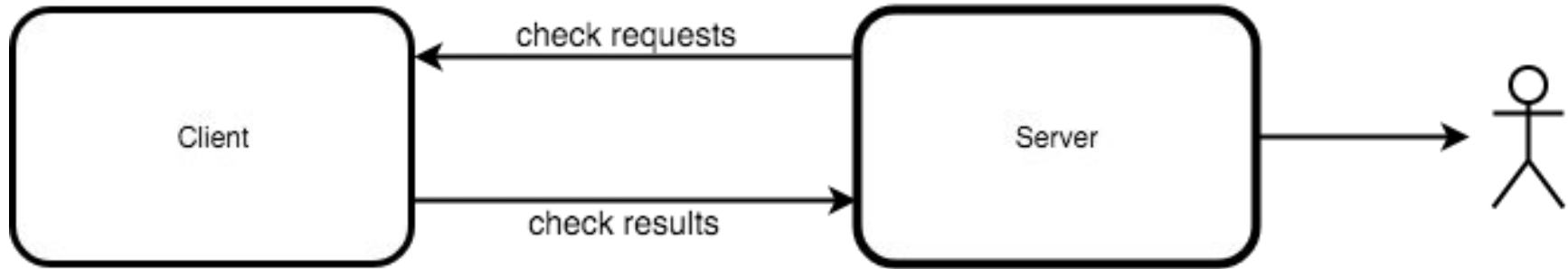


# Sensu - Overview

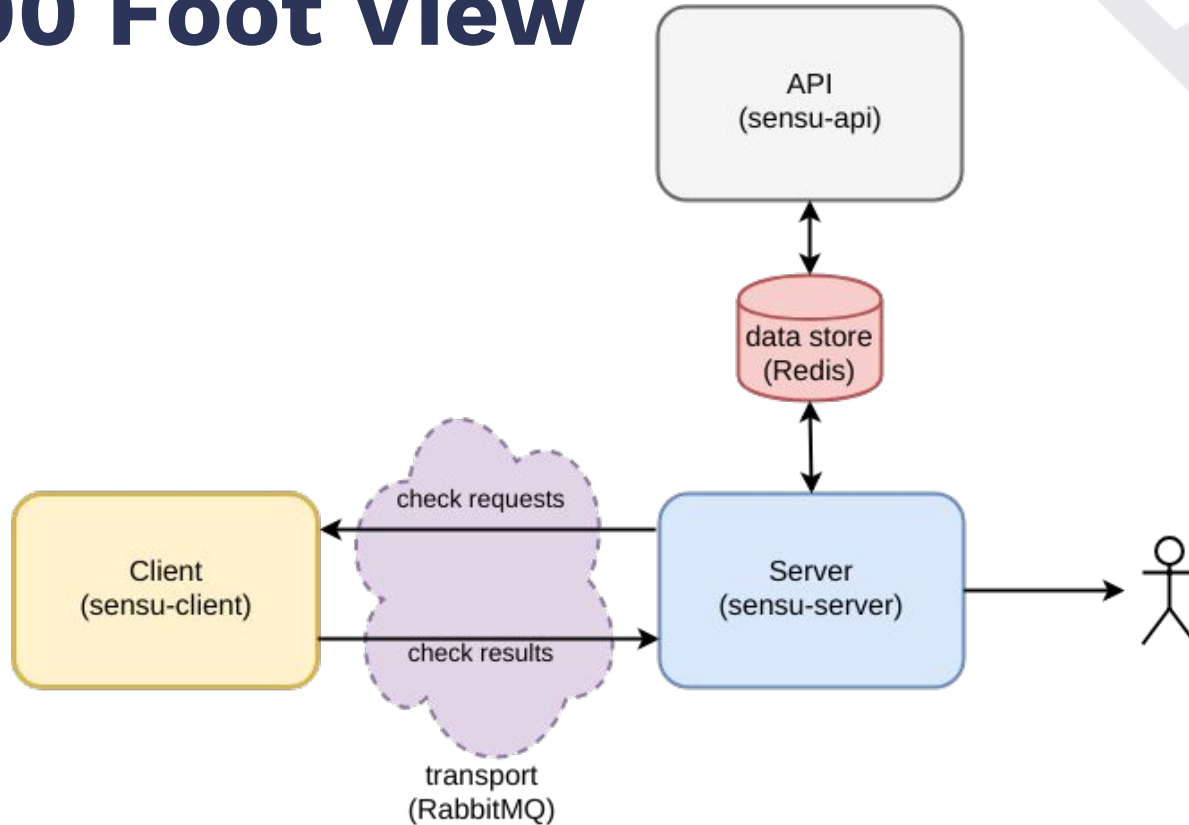
- A composable monitoring framework aimed at obviating the need to (re)build custom monitoring solutions.
- Translation?
- Difference from other monitoring software?



# 50,000 foot view



# 15,000 Foot View

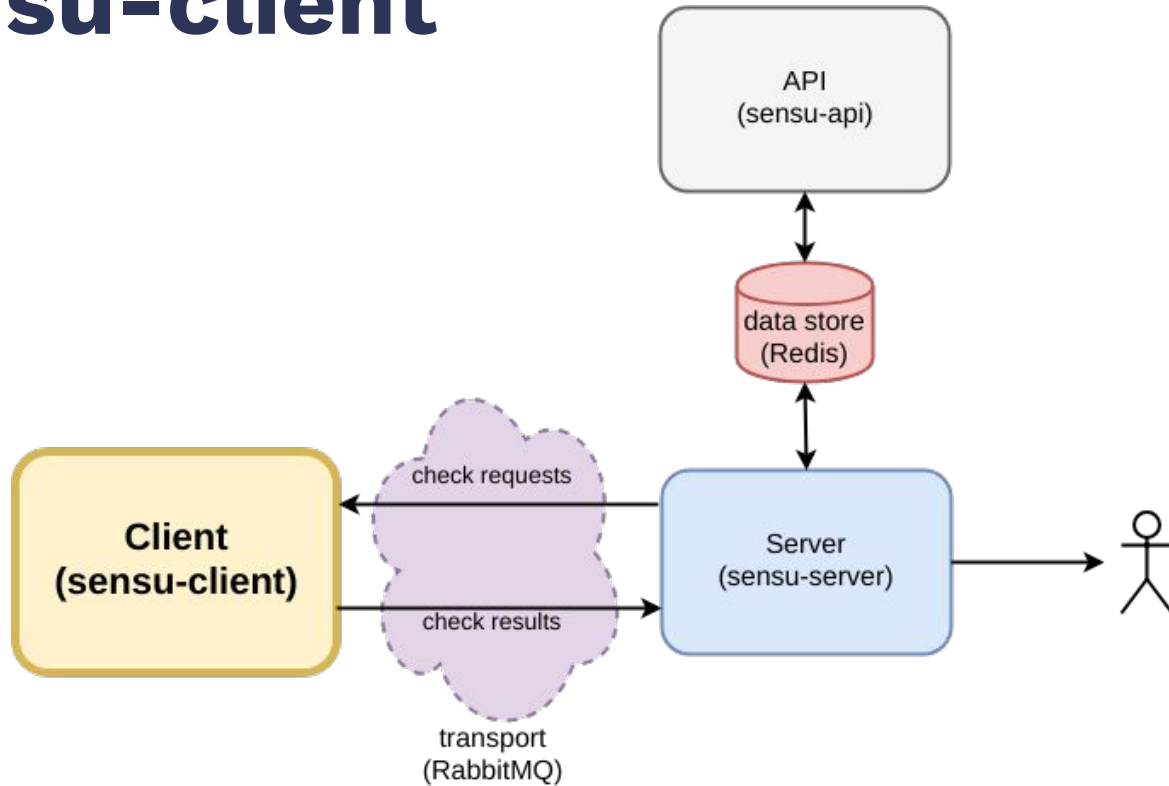


# Components





# sensu-client



# Example Client Config



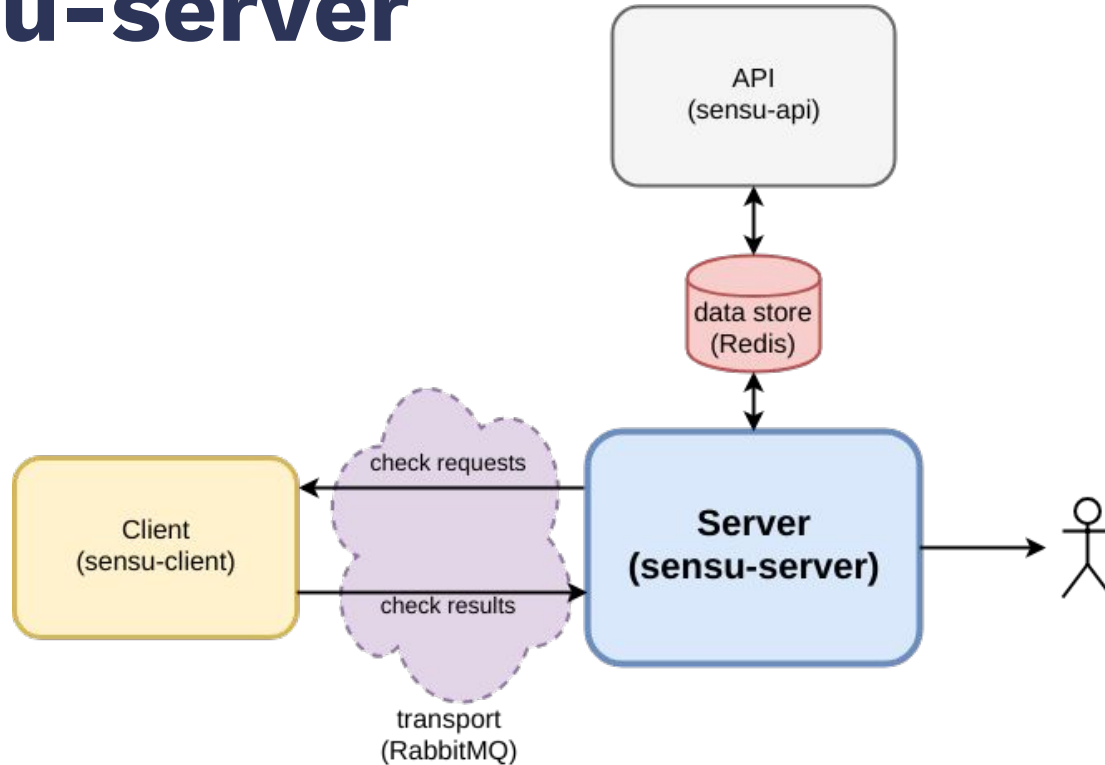
```
{
  "client": {
    "name": "i-274135e0",
    "address": "54.188.127.142",
    "subscriptions": [
      "production",
      "load_balancer"
    ]
  }
}
```

# Example Transport Config



```
{  
  "rabbitmq": {  
    "host": "127.0.0.1",  
    "port": 5672,  
    "vhost": "/sensu",  
    "user": "sensu",  
    "password": "secret"  
  }  
}
```

# sensu-server

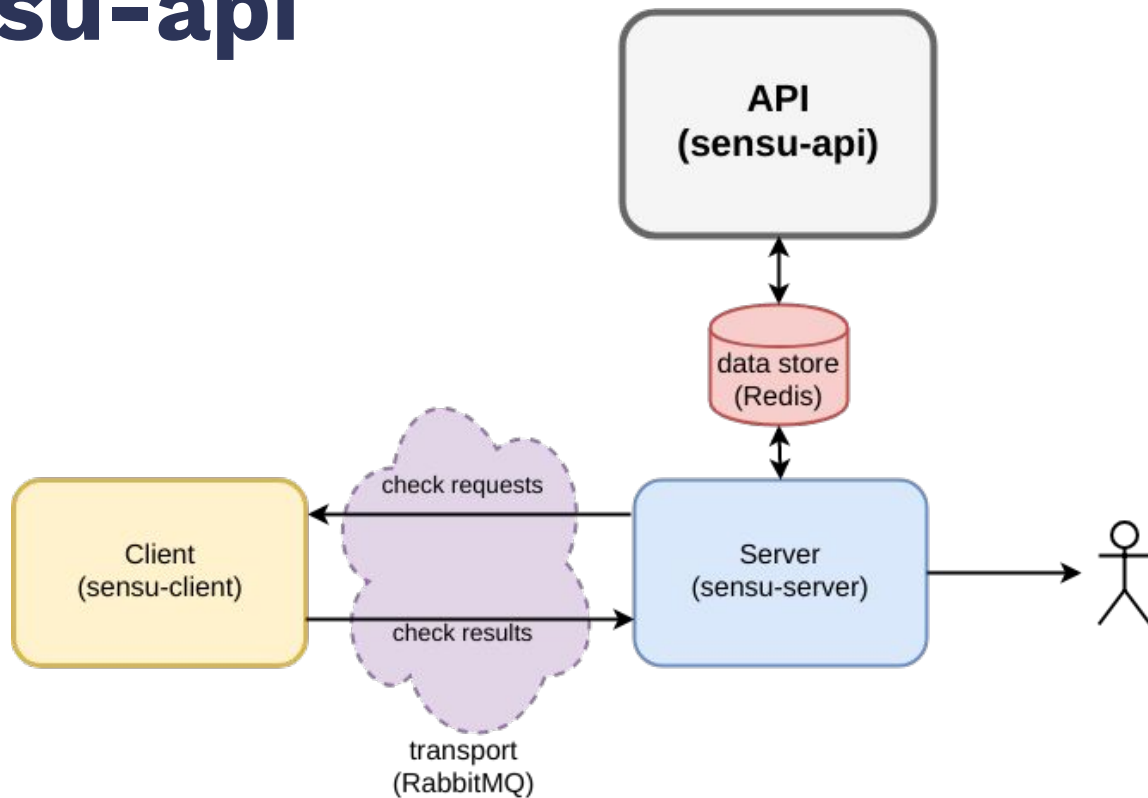


# Example Server Config



```
{  
  "api": {  
    "host": "127.0.0.1",  
    "port": 4567  
  },  
  "transport": {  
    "name": "rabbitmq"  
  }  
}
```

# sensu-api

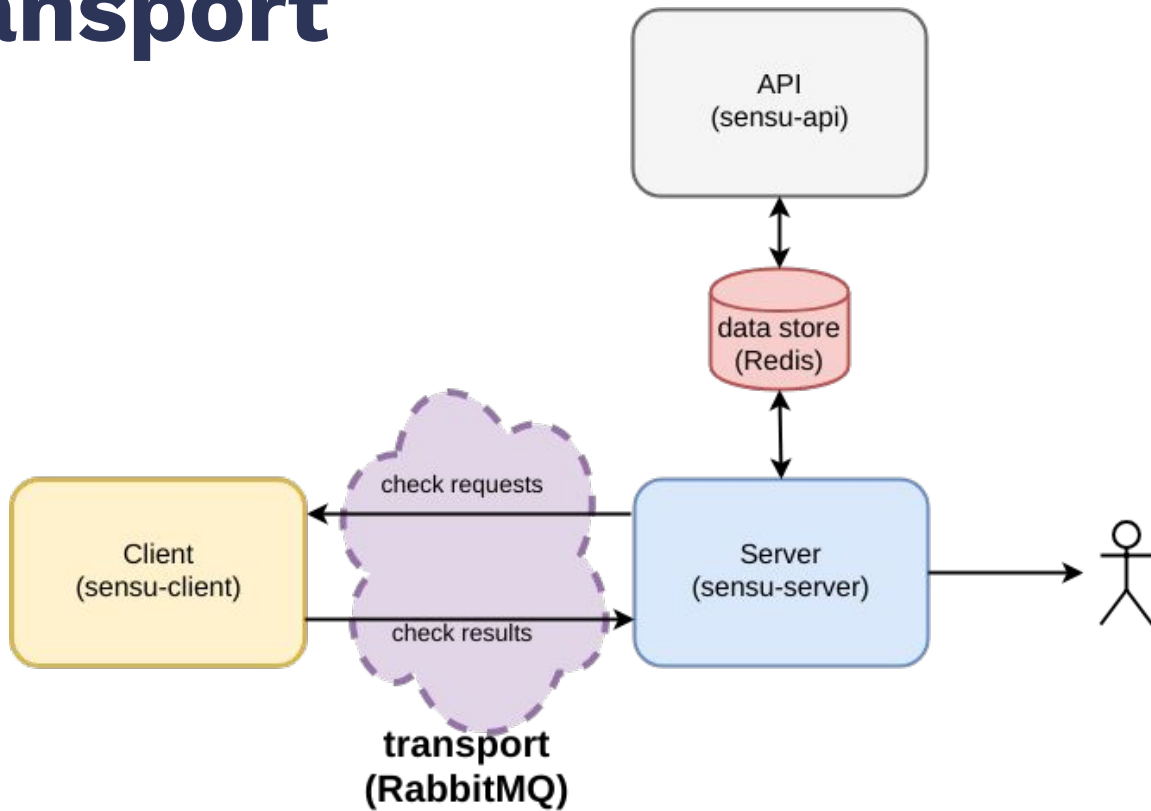


# Example API Config

```
{  
  "api": {  
    "host": "57.43.53.22",  
    "bind": "0.0.0.0",  
    "port": 4567  
  }  
}
```

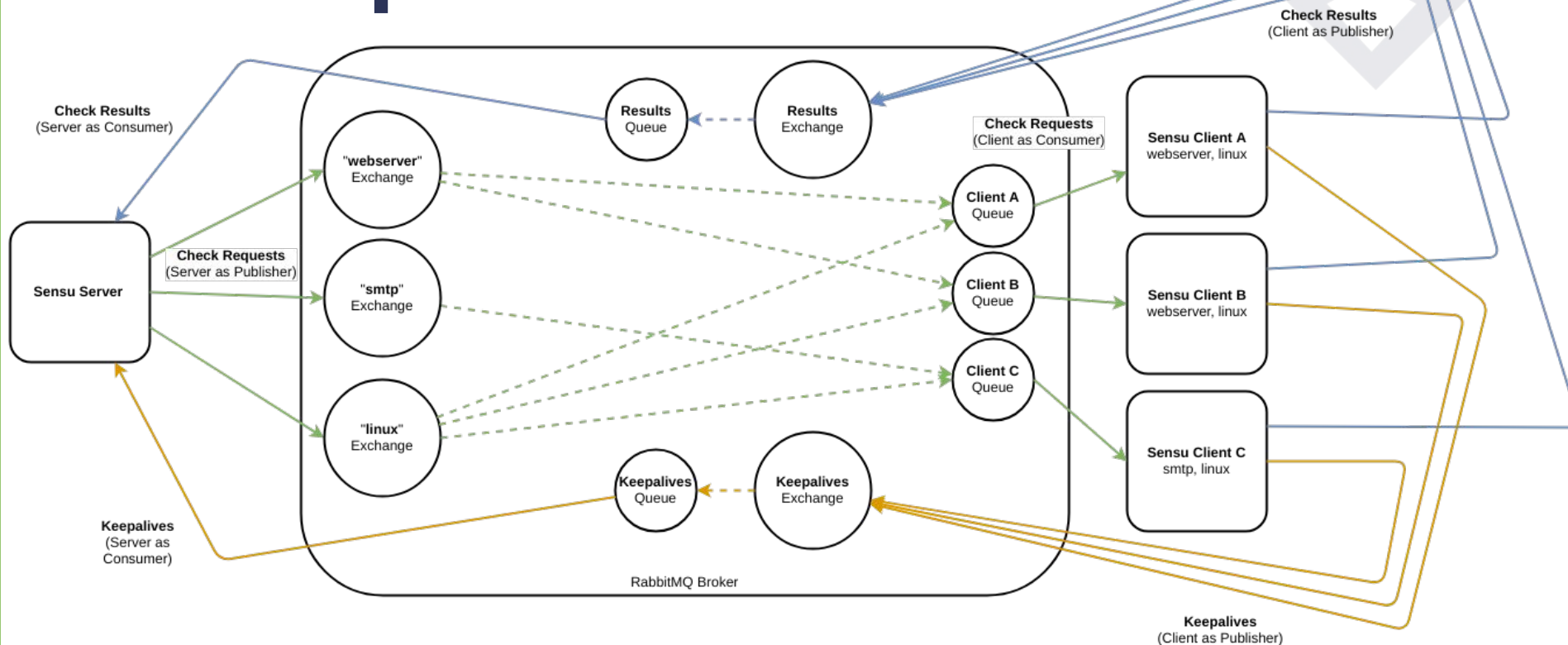


# Transport

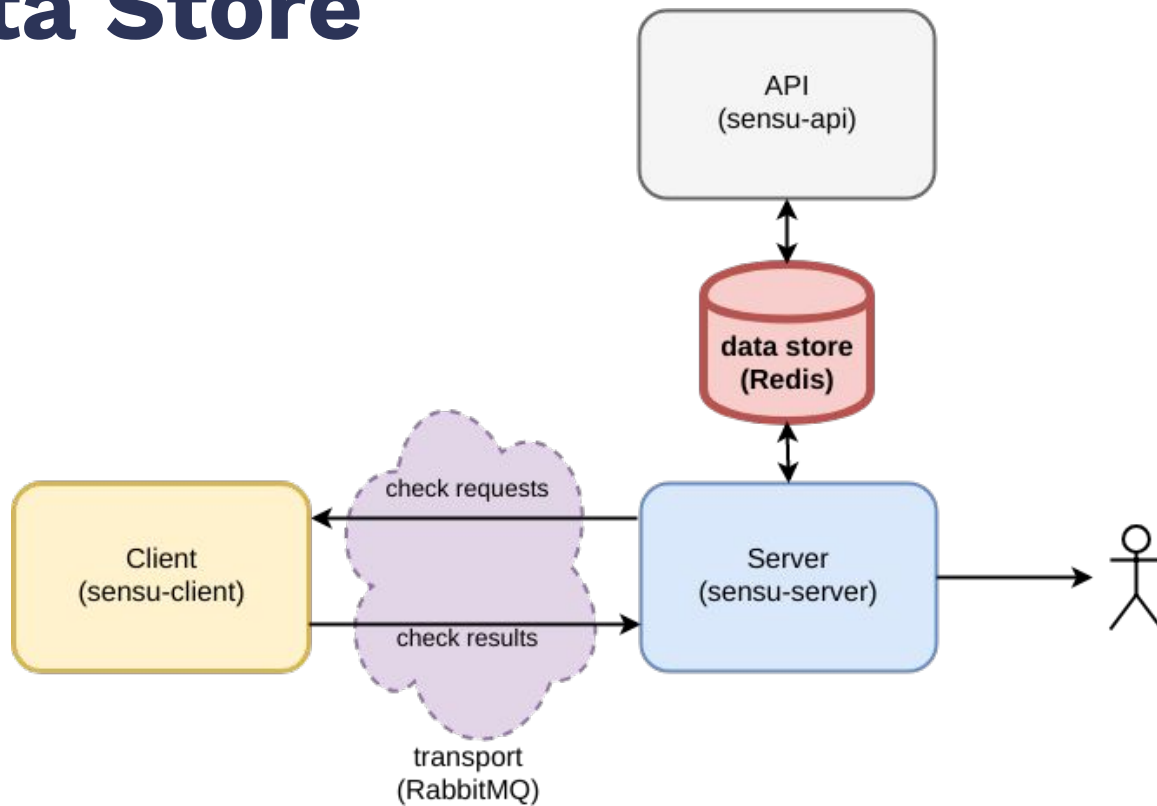




# Transport - ctd



# Data Store



# Dashboard - Uchiwa

- The dashboard for Sensu Core
- Provides a way graphical to interact with Sensu
- It's an optional component, but it makes interacting with Sensu easier



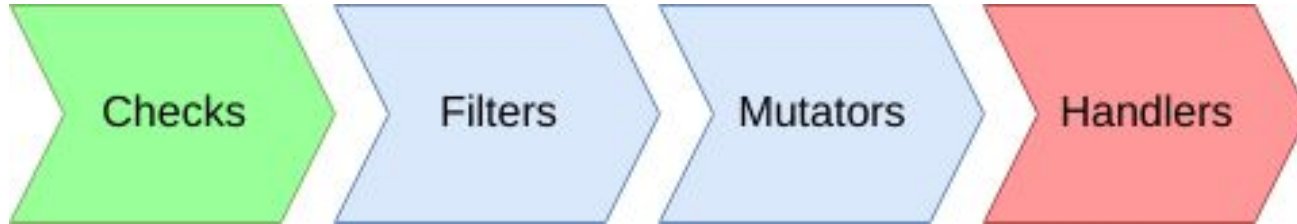


CLIENTS &gt; [REDACTED]

[REDACTED]	
a few seconds ago	
CNBEBOP	
_id	CNBEBOP/[REDACTED]
address	[REDACTED]
environment	prod
haproxy	{       "host": "localhost",       "password": "REDACTED",       "port": 9090,       "user": "cnmon"     }
keepalive	{       "handlers": [         "slack",         "email"       ],       "refresh": 30,       "thresholds": {         "critical": 180,         "warning": 180       }     }
name	[REDACTED]
safe_mode	false
socket	{       "bind": "127.0.0.1",       "port": 3030     }
subscriptions	all, linux, fail2ban, haproxy, keepalived
timestamp	2016-12-12 13:56:34
version	0.23.3

Check	Output	
check_cron	CheckProcess OK: Found 1 matching processes; cmd /cron/	a few seconds ago
check_keepalived_proc	CheckProcess OK: Found 3 matching processes; cmd /keepalived/	a few seconds ago
metrics-haproxy	[REDACTED] haproxy.broker00.session_current 1567 148154720...	3 minutes ago
metrics-proc-mem-us...	[REDACTED] proc_mem_usage.sensu.sensu-client 1030.92 1481...	5 minutes ago
check-cpu	CheckCPU TOTAL OK: total=10.06 user=1.44 nice=0.0 system=6.06 idle=89.94 ...	a minute ago
check-load	CheckLoad OK: Load average: 0.16, 0.21, 0.19	a few seconds ago
metrics-uptime	[REDACTED] uptime.uptime 12367988.73 1481547207 ...	3 minutes ago
check-ntp	CheckNTP OK: NTP offset by 0.01ms	a few seconds ago
metrics-netif	[REDACTED] io.rx_kB_per_sec 2.93 1470207163 ...	4 months ago
check_failedaccess	OK: 0 failure login attempts(warning at 10, critical at 20)	a few seconds ago
check-hardware-fail	CheckHardwareFail OK: Hardware OK	a few seconds ago
metrics-iostat-extended	[REDACTED] iostat.avg.cpu.pct_user 9.69 1481547147 ...	4 minutes ago
metrics-load	[REDACTED] load_avg.one 0.36 1481547206 ...	3 minutes ago
metrics-puppet-run	[REDACTED] puppet.resources.scheduled 0 1481547177 ...	4 minutes ago
check_ntpd	CheckProcess OK: Found 1 matching processes; cmd /ntpd/	a few seconds ago
check_haproxy_broker...	CheckHAProxy OK: UP: 100% of 3 /broker00/ services	a few seconds ago
metrics-memory	[REDACTED] memory.total 1034092544 1481547149 ...	4 minutes ago
check_sshd	CheckProcess OK: Found 1 matching processes; cmd /sshd/	a few seconds ago
check-puppet-last-run	PuppetLastRun OK: Puppet last run 3342 seconds ago	a few seconds ago
check-disk-usage	CheckDisk OK: All disk usage under 85% and inode usage under 85%	a few seconds ago
metrics-memory-perc...	[REDACTED] memory_percent.free 23.460770644527535 148154...	4 minutes ago
metrics-proc-cpu-usage	[REDACTED] proc_cpu_usage.haproxy.haproxy 8.1 1481547206 ...	3 minutes ago

# Event Processing Pipeline

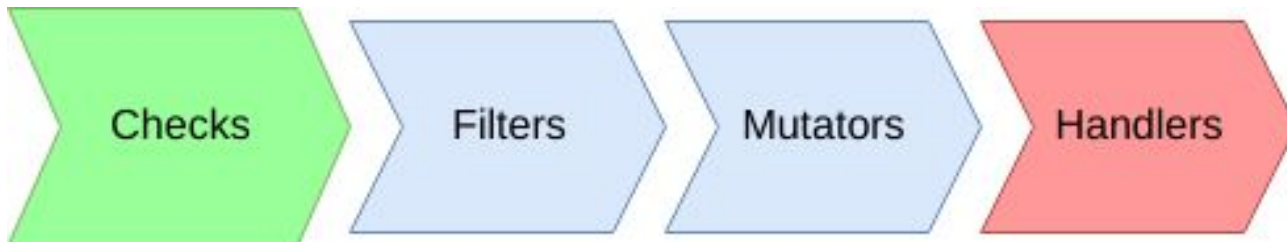


# Checks



Checks

# Event Processing Pipeline



# Check Components

- Check plugin
- Check definition





# Check Plugins

- Adhere to Nagios API
  - Exit status indicates status
  - Output to STDOUT provides context
- Simple to write and understand
- Can be in any language
- Thousands of existing plugins available



**0**

**Normal/OK**

**1**

**Warning**

**2**

**Critical**

**3+**

**Unknown**

# Check Definition Attributes



## Required

- `command`
- `subscribers` **or** `standalone`
- `interval` **or** `cron`

## Frequently used

- `type`
- `handlers`

## Advanced

- `source`
- `aggregates`
- `subdue`
- `hooks`
- `proxy_requests`

# Example Check Config



```
{
  "checks": {
    "check_haproxy": {
      "command": "check_haproxy.rb -s app01 -w40 -c25",
      "subscribers": ["load_balancer"],
      "interval": 30,
      "handlers": ["slack"]
    }
  }
}
```

# Check Results



# Example Check Result Message

```
{
  "client": {"name": "i-274135e0" },
  "check": {
    "name": "check_haproxy",
    "command": "check_haproxy.rb -s app01 -w 40 -c 25",
    "subscribers": ["load_balancer"],
    "interval": 30,
    "issued": 1445569640,
    "executed": 1445569641,
    "output": "UP - 85% of 10 /app01/ services",
    "status": 0,
    "duration": 0.87
  }
}
```

# Check Result Processing



- Check results update state in the data store
  - History registry
  - Results registry
  - Events registry (non-OK results)
- Check results are combined with additional state to create events
- Events are processed by a configurable pipeline

# Event Data



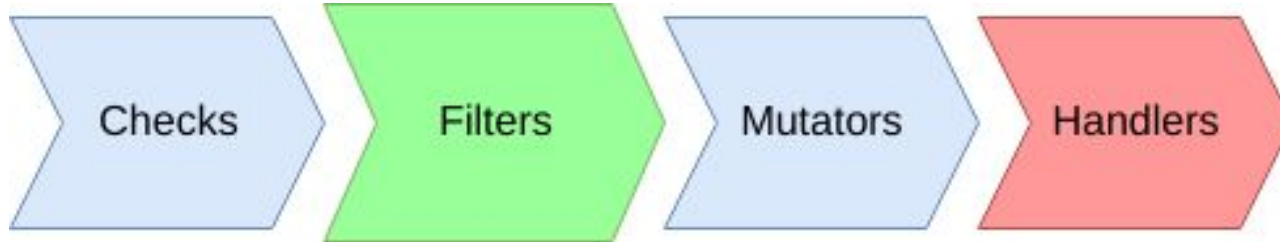
```
{
  "id": "ef6b87d2-1f89-439f-8bea-33881436ab90",
  "action": "create",
  "timestamp": 1460172828,
  "occurrences": 1,
  "check": {
    "...": "...",
    "total_state_change": 0,
    "history": ["0", "0", "0", "0", "0", "0"],
  },
  "client": { "...": "..." }
}
```

# Filters





# Event Processing Pipeline



# Filters

## Native filters

- User-defined via configuration
- Exact matching
- `eval()` matching

## Filter extensions

- Implemented as Sensu extensions
- Some examples built into Sensu Core
  - occurrences
  - check\_dependencies



# Filter Definition Attributes



Native filter definitions may

- Combine eval and exact matching
- Apply only during specific time windows using `when` attribute
- Invert their logic using `negate` attribute

# Exact Matching Native Filter



```
{
  "filters": {
    "env_production": {
      "attributes": {
        "client": {"environment": "production"}
      },
      "when": { "days": {
        "all": [{
          "begin": "5:00 PM",
          "end": "8:00 AM"}]
      }
    }
  }
}
```

# Attribute Evaluating Filter



```
{
  "filters": {
    "state_change_only": {
      "negate": true,
      "attributes": {
        "check": {
          "history": "eval: value.last == value[-2]"
        }
      }
    }
  }
}
```

# Mutators



# Event Processing Pipeline



# Mutator Components

- Mutator plugin
- Mutator definition





# Mutator Plugins

- Receive event data on STDIN
- Emit mutated event data on STDOUT

0

Normal/OK

1+

Critical

# Example Mutator Config

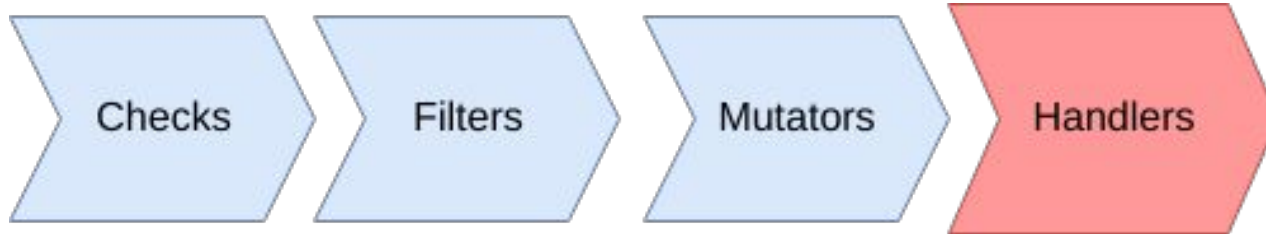


```
{  
  "mutators": {  
    "graphite": {  
      "command": "mutator-graphite"  
    }  
  }  
}
```

# Handlers



# Event Processing Pipeline



# Handler Components

- Handler definition
- Handler plugin (maybe)



# Handler Types



## Pipe

- Executed by Sensu server
- Event data sent to stdin
- Most powerful type

## Set

- List of handlers
- Pipeline spawned for each
- Tip: consider making your "default" a set

## TCP, UDP

- Sends event data to a remote host/service
- Each event spawns a new connection

## Transport

- Reuses connection to message bus
- Queues data for an external process to consume

# Handler Attributes

These attributes are common across handler types

- filters
- severities
- mutator
- timeout
- handle\_flapping
- handle\_silenced



# Handler Plugins

- Plugins are executables run by server
- Very simple to understand
- Very simple to write in any language
- Receive event data on STDIN
- Exit status indicates success/failure

0

**Normal/OK**

1+

**Critical**



# UDP Handler Example



```
{
  "handlers": {
    "graphite": {
      "type": "udp",
      "socket": {
        "host": "graphite.example.com",
        "port": 2003
      },
      "mutator": "graphite_events"
    }
  }
}
```

# Pipe Handler Example



```
{  
  "handlers": {  
    "pagerduty": {  
      "type": "pipe",  
      "command": "pagerduty.rb",  
      "severities": ["critical"],  
      "filters": ["occurrences"]  
    }  
  }  
}
```



# Resources

- Sensu
  - <https://docs.sensu.io>
  - <https://docs.uchiwa.io>
  - <https://github.com/sensu-plugins>
  - <https://github.com/asachs01/sensu-up-and-running>
  - <https://slack.sensu.io>
- Other Resources
  - [Monitoring and Observability](#) - Cindy Sridharan
  - [Practical Monitoring](#) - Mike Julian
  - [The Art of Monitoring](#) - James Turnbull

# Q & A



A low-angle, upward-looking perspective of several modern skyscrapers with glass facades, creating a sense of height and urban density. The buildings are rendered in a dark blue, monochromatic style. The text "BREAK TIME" is centered in the middle of the image in a white, sans-serif font.

BREAK TIME



# Workshop Time



# Getting Started

- Virtualbox
- Vagrant
- Git
- <https://github.com/asachs01/sensu-up-and-running>



# Clone the Repo & Start the VM

```
git clone https://github.com/sensu/training-vagrant.git  
cd training-vagrant/workshops/intro-to-sensu  
vagrant up
```





# Vagrantfile

```
Vagrant.configure("2") do |config|  
  config.vm.box = "bento/centos-7.4"  
  config.vm.hostname = "sensu-up-and-running-01"  
  config.vm.network "private_network", type: "dhcp"  
  config.vm.provision "shell", path: "../..//scripts/sensu-and-graphite.sh"  
  config.vm.provider "virtualbox" do |vb|  
    vb.memory = 1024  
  end  
end
```



# Access Vagrant Guest

```
vagrant ssh
```



# For Starters

- Take a moment and explore
- Everything lives in `/etc/sensu`
- Head over to the dashboard and poke around.



# Write your own...

- Check
- Filter
- Handler



# Q & A





# Resources

- Sensu
  - <https://docs.sensu.io>
  - <https://docs.uchiwa.io>
  - <https://github.com/sensu-plugins>
  - <https://github.com/sensu/training-vagrant>
  - <https://slack.sensu.io>
- Other Resources
  - [Monitoring and Observability](#) - Cindy Sridharan
  - [Practical Monitoring](#) - Mike Julian
  - [The Art of Monitoring](#) - James Turnbull



# Reach Out

Me:

- Aaron Sachs
  - Twitter: asachs01

Sensu:

- Sensu.slack.io - Community Slack Channel
- Feedback on the workshop/training questions
  - training@sensu.io

FIN

